

FISHES FROM NAURU, GILBERT ISLANDS, OCEANIA.

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(Plate xiv; three Text-figures.)

[Read 31st August, 1938.]

Nauru or Pleasant Island, sometimes called Nawodo or Shank Island, is the westernmost of the Gilbert Islands in Oceania. It was discovered by Captain Fearn of the "Hunter" in the 1790's, and is situated in Lat. $0^{\circ} 25' S.$, Long. $167^{\circ} 05' E.$

Its nearest neighbour is Ocean Island, which will therefore be considered along with Nauru as a single faunal region. Ocean Island has also been named Bonabe, Panopea, Baanopa, or Paanopa, but should not be confused with Ponapé or Ponapi (i.e., Puynepet Island) in the Carolines, or with Ocean Island in the Hawaiian group. The Ocean Island with which we are concerned is in Lat. $0^{\circ} 52' 02'' S.$ and Long. $169^{\circ} 35' E.$ It was discovered in 1804 from the ship "Ocean".

The fishes of Nauru and Ocean Island are identical with species recorded from the Carolines, Gilberts, and Santa Cruz Islands. They belong therefore to the Garretian Province of the Melanesian Marine Region. Those interested in the relationships of this province to the faunas of Australian seas may refer to the section on zoogeography in the *Australian Zoologist*, viii, 4, 1937, pp. 268-272.

Because of the isolated position of Nauru and Ocean Islands, very few naturalists or collectors have visited them. The first contribution to our knowledge of their zoology was made when, some thirty or forty years ago, Messrs. F. Danvers Power and A. E. Stephen visited them on behalf of the Pacific Islands Company. They brought back to Sydney some birds, reptiles, fishes, molluscs, arthropods, crustacea, and echinoderms, and most of their specimens are still preserved in the Australian Museum. The fishes were registered nos. L5016 to 5042 and 5046 to 5052, and on this basis Waite wrote the first list of the fishes from these regions, recording (1903) from Pleasant Island (Nauru): *Gymnothorax pictus* Ahl., *Fistularia depressa* Günther, *Mulloidides samoensis* Günther, *Caranx hippos* Linnaeus (regarded as poisonous at times!), *Anthias pleurotaenia* Bleeker, *Cirrhitus maculatus* Lacépède, *Glyphidodon browariggii* Bennett, *Thalassoma purpurca* Forskal, *Thalassoma melanochir* Bleeker, *Teuthis lineatus* Linnaeus, *Teuthis triostegus* Linnaeus, *Naseus unicornis* Forskal, *Salaria periorphalmus* Cuvier and Valenciennes, and *Rhomboidichthys pantherinus* Rüppell; and from Ocean Island (Paanopa): *Gymnothorax flavomarginatus* Rüppell, *Gymnothorax tessellatus* Richardson, *Tylosurus platyrus* Rüppell (? = *Belone depressa* Günther), *Fistularia depressa* Günther, *Holocentrus erythroceus* Günther (native name *Te breuo*), *Promethichthys prometheus* Cuvier and Valenciennes, *Caranx hippos* Linnaeus, *Kuhlia taeniura* Cuvier and Valenciennes, *Epinephelus merra* Bloch, *Teuthis triostegus* Linnaeus, *Gobius albopunctatus* Cuvier and Valenciennes, and *Salaria meleagris* Cuvier and Valenciennes.

* Contribution from the Australian Museum.

To the above list Waite added, "The following are given as native names at Ocean Island; as specimens were not obtained the species cannot be given. Hammer-headed Shark, *Te-pakoa te anoa*. Tiger Shark, *Emurr*. Flying Fish, *Te-nouti*. Palu, *Te-kanebek*.

"The last-named, of which I have seen a photograph, is *Ruvettus pretiosus*, Cocco, a species I first recorded from the South Pacific (Waite, *Aust. Mus. Mem.*, iii, 1899, p. 539)."

The Australian Museum series of fishes which had been utilized by Waite remained until recently the only collection, so far as we can trace, ever made and reported upon from Ocean and Pleasant Islands, and it appears that this Museum is the only one in which fishes from those islands are preserved. Thus authors on the fishes of Oceania have added no further records to those of Waite, unless by way of bringing his nomenclature more up to date or reclassifying a few small specimens which he left untouched.

Fowler (1928) includes the fishes of Ocean and Pleasant Islands as follows: *Lycodontis picta* (Ahl.) (p. 51), *Lycodontis flavomarginata* (Rüppell) (p. 55), *Lycodontis favaginea* (Schneider) (= *Gymnothorax tessellatus* in Waite) (p. 57), *Strongylura tahitiensis* Fowler & Bean (= *Tylosurus platurus* Waite) (p. 73), *Platophrys pantherinus* (Rüppell) (p. 91), *Holocentrus erythraeus* Günther (p. 99), *Fistularia petimba* Lacépède (p. 117), *Promethichthys prometheus* (Cuvier) (p. 135), *Ruvettus pretiosus* Cocco (p. 135), *Caranx ignobilis* Forskal (= *C. hippos* in Waite) (p. 148), *Kuhlia taeniura* (Cuvier) (p. 171), *Serranus merra* (Bloch) (p. 181), *Anthias pleurotaenia* Bleeker (p. 186), *Mulloides samoensis* Günther (p. 234), *Cirrhitus pinnulatus* (Bloch & Schneider) (= *C. maculatus* in Waite) (p. 237), *Hepatus triostegus* (Linné) (p. 264), *Hepatus lineatus* (Linné) (p. 269), *Naso unicornis* (Forskal) (p. 277), *Abudefduf biocellatus* (Quoy & Gaimard) (= *Glyphidodon brownriggii* in Waite) (p. 321), *Thalassoma purpureum* (Forskal) (p. 353), *Thalassoma melanochir* (Bleeker) (p. 355), *Bathygobius fuscus* (Rüppell) (= *Gobius albopunctatus* in Waite) (p. 405), *Salarias periophthalmus* Valenciennes (p. 439), *Salarias meleagris* Valenciennes (p. 440).

In 1931 Fowler issued his first supplement to "The Fishes of Oceania", but there are no fishes from Ocean or Pleasant Island in that paper. However, in Supplement 2, Fowler (1934) lists some species from these islands from a manuscript catalogue of the fishes from Oceania in the Australian Museum. Here, therefore, we find recorded: *Chanos chanos* (Forskal), "Introduced" (p. 386), *Lycodontis flavomarginata* (Rüppell) (p. 390), *Lycodontis favaginea* (Schneider) (p. 390), *Belone platura* Bennett (p. 392), *Platophrys pantherinus* (Rüppell) (p. 394), *Fistularia petimba* Lacépède (p. 398), *Promethichthys prometheus* (Cuvier), 530 mm. long (p. 400), *Serranus merra* (Bloch) (p. 410), *Anthias pleurotaenia* Bleeker (p. 411), *Cirrhitus pinnulatus* (Schneider) (p. 422), *Thalassoma quinquevittatus* (Lay & Bennett) (p. 438), *Thalassoma melanochir* (Bleeker) (p. 438), *Bathygobius fuscus* (Rüppell) (p. 442), *Salarias periophthalmus* Valenciennes (p. 446).

We have considered it necessary to list the above records in detail to avoid the necessity of searching again through nearly seven hundred large double-columned pages in Fowler's works.

Whitley (1935, p. 233) gave the results of his examination of some "old collection" percoids in the Australian Museum from Nauru. These had evidently formed part of Waite's original series, but had been left unclassified. They were thereupon determined as novelties and one was named *Chromanthias exilis* (family

Anthiidae) and another species was left until now before being described as new. He also noted that Waite's *Anthias pleurotaenia* Bleeker belonged to the genus *Pseudanthias*. When dealing with devil rays, the same author (*Austr. Mus. Mag.*, vi, 1936, p. 11, and Whitley, 1936, p. 181) quoted an account of a Nauruan Devil Ray, tentatively identified as *Manta? banksiana* (Lacépède). A File Fish, *Sufflamen fraenatus* (Latreille) was recorded from Nauru (Whitley, 1937).

A. F. Ellis (1936) gave a plate (opposite p. 177) of a Marlin swordfish from Nauru and discussed fishing methods in general. A more scientific account of the fisheries was given in the same year by Kayser (1936, p. 92). See also Power, *Aust. Naturalist*, Jan., 1916, 115-6.

Also in 1936, photographs of a large Nauruan shark were submitted to us for identification and determined as a species of *Echinorhinus*, though, as the specimen was not preserved or measured, exact specific identification was impracticable. It was interesting, however, to find this genus of sharks in Oceania.

The above gives a résumé of our knowledge of the fish-fauna of Ocean and Pleasant Islands down to recent years, when further collections have been made and submitted to us for identification and report. For these we are indebted to Professor W. J. Dakin, who made an extensive collection during his visit to the Island in 1934, to Rupert C. Garsia, Esq., the Administrator, who has forwarded specimens from time to time, and finally to Professor Harvey Sutton, who made a collection with the object of determining the food values of the different species used in the Hospital Kitchen. Professor Sutton secured these fish during a recent visit (March, 1937) and was good enough to hand them to us for identification.

The collections made by these gentlemen duplicate some of Waite's species, indicating, as one would expect, that these are constant or common at Nauru, but they also contain some interesting new records as detailed hereunder.

We are indebted to Commander Rupert C. Garsia, Administrator of Nauru, for supplying us with the native names of the fishes. These are quite unlike the native names given to these, or allied, species in Hawaii, Tahiti, Rarotonga, and elsewhere. It is noteworthy that more than one native name may be applied to what a systematist would consider to be a single species of fish.

In this paper we do not presume to give a comprehensive list of the fishes of Nauru, though we include all the species so far known from there. If that island is like most of the others in Oceania, it probably supports a fauna of several hundred species, whereas our list includes 74 species. Neither do we give full references to literature or lengthy synonymies, as these may be found in the many excellent treatises on Indo-Pacific fishes. Some changes in the scientific nomenclature of many of the fishes of Oceania will have to be made at no distant date, as all authorities realize, but we have felt that, at this stage, it were better to postpone making more drastic alterations until further revision of some of the genera (e.g., "*Tenthis*" and "*Caranx*") be attempted in the future. The preserved material in the Australian Museum is registered under the following numbers: I.5016 to 5042; I.5046 to 5052; I.6681 to 6682; IA.6990 to 7021; IA.7125 to 7178.

Family ECHINORHINIDAE.

Genus ECHINORHINUS Blainville, 1816.

1. ECHINORHINUS sp. Bramble shark.

Photographs of a large shark from Nauru have been identified as representing this distinctive genus, which has not hitherto been recorded from Oceania.

Unfortunately no detailed measurements, teeth or other parts, were secured, so that the species cannot be identified. The length was said to have been 10 feet.

Nauru (A. S. Lloyd); September, 1936.

Family SPHYRNIDAE.

Genus SPHYRNA Rafinesque, 1810.

2. SPHYRNA ZYGAENA (Linné). Te-pakoa te anoa; Hammerhead Shark.

In the absence of specimens or detailed measurements and photographs, we can only surmise that the Hammerhead Shark may be this species.

Ocean I. (Waite).

[(2a) Waite also recorded a Tiger Shark or *Emurr* from Ocean Island, but it is impossible without a specimen to say even to what family this belongs.]

Family CERATOPTERIDAE.

Genus MANTA Bancroft, 1829.

3. MANTA BANKSIANA (Lacépède). Devil Ray.

Raja banksiana Lacépède, *Hist. Nat. Poiss.*, ii, 1800, p. 105, Pl. v, fig. 3. East Indies.—*Manta banksiana* Whitley, *Austr. Zool.*, viii, 1936, p. 180.

A Devil Ray, 8½ feet across the pectoral fins, was found washed up on the reef at Nauru in 1935 by Mr. F. H. Davies. It was a female, containing an embryo, but unfortunately no parts of the specimen have been preserved.

Nauru (Davies).

Family CHANIDAE.

Genus CHANOS Lacépède, 1803.

4. CHANOS CHANOS (Bonnaterre). Ibija; Milk Fish (Baños of the Philippines).

Chanos chanos Fowler, *Mem. Bish. Mus.*, xi, 6, 1934, p. 386.

Nauru (Dakin). Australian Museum registered numbers IA.7125-6. Two specimens from Fish Pond. For a reference to the Ibija fisheries, *vide infra*, p. 303.

Family MURAENIDAE.

Genus GYMNOTHORAX Bloch, 1795.

5. GYMNOTHORAX FLAVIMARGINATUS (Rüppell). Reef Eel.

Gymnothorax flavimarginatus Waite.—*Lycodontis flavomarginata* Fowler, 1928 and 1934.

Ocean I. (Waite).

6. GYMNOTHORAX FAVAGINEUS (Bloch & Schneider). Spotted Reef Eel.

Gymnothorax tessellatus Waite.—*Lycodontis favaginea* Fowler, 1928 and 1934. Ocean I. (Waite).

7. GYMNOTHORAX ZONIPECTIS Seale. Etari; Reef Eel.

Nauru (Dakin). IA.6991.

8. GYMNOTHORAX DAKINI, n. sp. Earuero; Dakin's Reef Eel. Pl. xiv, fig. 2.

A Reef Eel in the Nauru collection bears the native name Earuero, but requires a new scientific name since it does not agree with descriptions, figures, or specimens of any Indo-Pacific species known to us. We therefore have much pleasure in naming it in honour of Professor W. J. Dakin, D.Sc., to whom we are indebted for the fine series of fishes he secured. The measurements given below are approximate, since, as is usual with eels, the specimen is rather distorted in preservative.

Head (61 mm.) 9.4, depth of trunk (54) 10.6 in total length (576). Distance from snout to anus (240) 1.4 in tail (336). Head 2.9 in trunk (179). Eye (5) 2 in snout (10) which is greater than interorbital (8.5). Gape (22) 2.77 in head,

Top of head bulbous; snout blunt and short; eye small, its diameter less than that of gill-opening. Anterior nostrils tubular, but without flaps; posterior nostrils pore-like. A few open mucus pores around jaws. Mouth reaching backward well behind eye. Teeth conic, without serrations. None of them is granular or molar-like: they are pointed fangs, those on roof of mouth being depressible. They extend in an even row round the upper jaw and intermaxillary, and there is a series of about seven rather larger maxillary fangs forming an inner row on each side. About four enlarged teeth behind the intermaxillary ones. A well developed row of teeth on each side of vomer. Mandibular teeth in a single row laterally, but anteriorly there are several inner teeth grouped asymmetrically, giving a bi- or tri-serial appearance. Throat with a few longitudinal furrows.

Body elongate, rather robust anteriorly, becoming compressed towards end of tail. The skin is smooth and tough and puckered into numerous scale-like folds. Anus large, in anterior half of fish. Dorsal fin originating before vertical of gill-openings and continuing to the caudal. It is very little elevated and is so invested with adipose tissue that the rays cannot be felt. Anal similar to dorsal, originating a short distance behind vent. Caudal fin very small. Colour, in formalin, pale yellowish-brown, lightest on snout and belly. This ground colour is mottled with darker on body and there is a faint lilac tinge on the dark posterior part of the head and towards end of tail. Edges of fins pale dirty-yellowish, not mottled. Teeth brown. No cross-bands or striking coloration; no dark patch at gill-openings or at rictus.

Described and figured from the holotype of the species, a specimen 576 mm. long, from Nauru, Gilbert Islands, Oceania (Professor Dakin). Australian Museum registered no. IA.6990.

The blunt snout, dentition (as described), and small eye are useful recognition marks.

9. *GYMNOTHORAX GARSIAE*, n. sp. Garsia's Reef Eel. Pl. xiv, fig. 3.

One specimen of a small, very dark coloured Reef Eel appears to represent an undescribed species, with which we have pleasure in associating the name of Commander Rupert C. Garsia, Administrator of Nauru, in appreciation of his assistance to all concerned in making this collection.

Head (16 mm.) 8, depth of body (8) 16 in total length (129). Head and trunk (59) nearly 1.2 in tail (70). Eye (1) 3 in snout (3). Gape (6) 2.6 in head.

General characters as for most species of *Gymnothorax*, but the size is small, and the body not very compressed. Dorsal fin commencing before level of gill-openings, anal just behind vent, both fins being well developed and confluent with the caudal. The teeth are long, acute fangs, largest anteriorly. One very large depressible fang behind the intermaxillary series and before the single vomerine row of smaller teeth. An inner lateral series of four fangs on each side of maxillary teeth.

Coloration uniform, without bands or spots. Very dark brown to blackish, with a narrow edging of white around the tip of the confluent fins around end of tail.

Holotype registered no. IA.7171 in the Australian Museum. Collected on the reef flat at Nauru for Professor Harvey Sutton. Total length 129 mm.

Genus *ANARCHIAS* Jordan & Seale, 1906.

10. *ANARCHIAS KNIGHTI* Jordan & Seale. Deduwidaw; Reef Eel.

Anarchias knighti Jordan & Seale, *Bull. U.S. Bur. Fisheries*, xxv, 1905 (Dec. 15, 1906), p. 205, fig. 10. *Ex* Jordan and Starks MS. Samoa.

One specimen, about 200 mm. long, of this small reef eel, which is distinguished by having no anal fin.

Nauru (Sutton). IA.7162.

Genus *SIDERA* Kaup, 1856.

11. *SIDERA PICTA* (Thunberg). Eamwit or Egamagamoe; Reef Eel.
Gymnothorax pictus Waite.—*Lycodontis picta* Fowler.

Nauru (Waite; Dakin). IA.6992 and IA.7147-8. One (IA.6992) as *Egamagamoe*, and two (IA.7147-8) labelled as Reef Snake, *Eamwit*.

Family OPHICHTHYIDAE.

Genus *LEIURANUS* Bleeker, 1852.

12. *LEIURANUS SEMICINCTUS* (Lay & Bennett). Deimon; Snake Eel.

One specimen, 212 mm. long, with 29 dark bands.

Nauru (Sutton). IA.7163.

Family AULOSTOMATIDAE.

Genus *AULOSTOMUS* Lacépède, 1803.

13. *AULOSTOMUS CHINENSIS* (Linné). Edabweo; Painted Flute-mouth.

Nauru (Dakin). IA.6993.

Family FISTULARIIDAE.

Genus *FISTULARIA* Linné, 1758.

14. *FISTULARIA DEPRESSA* Günther. Dabweo; Flutemouth.

Fistularia depressa Waite.—*Fistularia pectimba* Fowler, 1928 and 1934.

Nauru (Waite). Ocean I. (Waite).

Family BELONIDAE.

Genus *PLATYBELONE* Fowler, 1919.

15. *PLATYBELONE PLATURA* (Bennett). Emwa; Long Tom.

Tylosurus platurus Waite.—*Strongylura tahitiensis* Fowler, 1928.—*Belone platura* Fowler 1934.

Ocean I. (Waite). Nauru (Dakin; IA.6996).

Family HEMIRAMPHIDAE.

Genus *HEMIRAMPHUS* Cuvier, 1816.

16. *HEMIRAMPHUS MARGINATUS* (Bonnaterre). Emwaijeb; Garfish.

One specimen, identified as the *H. marginatus* of authors.

Nauru (Dakin). IA.6994.

Family EXOCOETIDAE.

MACULOCOETUS, n. gen.

Orthotype, *Maculocoetus suttoni*, n. sp.

The genus represented by our Nauruan flying fishes requires separation from the true *Cypsilurus* of Swainson (Nat. Hist. Class. Fish, Amphib. & Rept., i, Oct., 1838, p. 299, fig. 63) because that name was introduced for a "bearded" juvenile of an American species regarded by Bruun (Dana Rep., vi, 1935, p. 52) as the young of *C. comatus* (Mitchill). The genotypical species differs from ours in the absence of the dark spot on the dorsal fin, the smaller number of predorsal scales (26:38-40), presence of palatine teeth, and a number of minor characters.

Bruun (*loc. cit.*, p. 84) subdivided *Cypsilurus* into four subgenera. Our species comes nearest to *C. lineatus* in his key and would thus appear to enter his subgenus

Procyprisilurus, which is synonymous with *Exonantes* Jordan and Evermann (see Whitley, *Rec. Aust. Mus.*, xx, 1937, p. 11). The genotype of *Procyprisilurus* = *Exonantes*, is *Exocoethus exsiliens* Linné 1771, from Carolina, which differs from our species in the smaller number of predorsal scales (29:38-40), and in the larger number of vertebrae (*C. exsiliens* 44-45, *Maculocoetus suttoni* 42).

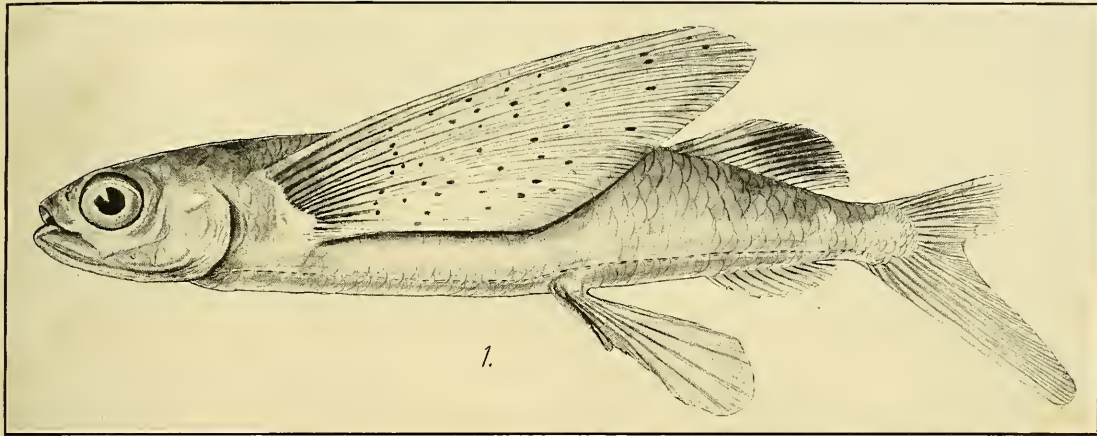
Our new genus includes *atrisignis* Jenkins, probably *spilopterus* C. & V., and probably *poclitopterus* C. & V. The systematic description of the new form is as follows:

17. MACULOCOETUS SUTTONI, n. sp. Emor or Te-nouti; Flying Fish. Plate xiv, fig. 1.

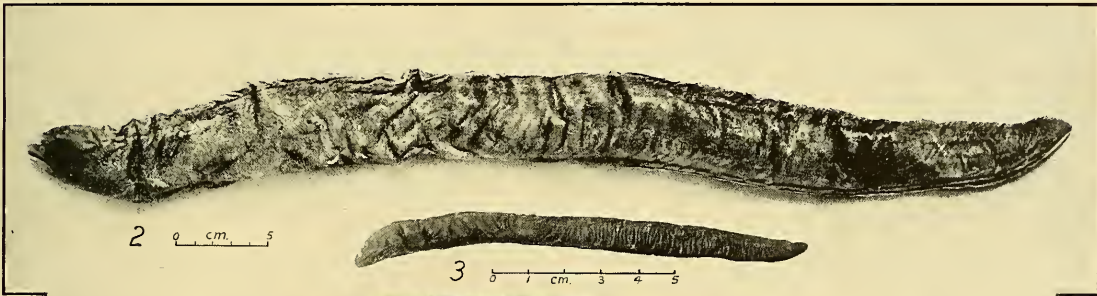
Head 4.6 in length; depth 5.2; D.12; A.10; P.12-13; lateral line 68-70 scales; predorsal scales 38-40; scales between origin of dorsal and lateral line 9.

Body elongate, broadest at about half-way between origin of pectorals and origin of dorsal. Posterior portion of head broad dorsally, tapering somewhat towards snout; interorbital space slightly concave and covered by rugose scales. Interorbital space less than distance from opercle margin to eye margin. Eye large, its centre anterior to centre of head. Snout less than eye diameter, lower jaw slightly protruding, maxilla included and falling short of anterior margin of eye. Pectorals reach beyond the tip of last dorsal ray (on the type specimen the ends of the pectoral rays were broken off, so this character was confirmed from the paratype). Second pectoral ray branched. Ventrals reach to about two-thirds the base of the anal, their origin being nearer to the base of the caudal than to the eye margin (13:10). Origin of dorsal very little in advance of the vent (almost opposite), its distance from the first caudal ray being 1.2 times the head-length. Longest dorsal ray 2 in head. Lower caudal lobe the longer. The proportions and numerical characters of the type specimen, and of two additional individuals are set forth in the table below.

	Type No. IA.6996. Nauru.		No. IA.7142. Nauru.		No. IA.7143. Nauru.	
	mm.	% S.L.	mm.	% S.L.	mm.	% S.L.
Ventral rays	7	—	7	—	7	—
Dorsal rays	12	—	12-13	—	12	—
Anal rays	10	—	10	—	10	—
Pectoral rays	12-13	—	13-14	—	12-13	—
Vertebrae	—	—	—	—	42	—
Gill rakers	—	—	—	—	29	—
Predorsal scales	38-40	—	ca. 37	—	ca. 38	—
Transverse scales (mid-dorsal to l. lat.)	9	—	9	—	9	—
	mm.	% S.L.	mm.	% S.L.	mm.	% S.L.
Standard length	260	—	270	—	260	—
Precanal length	199	76	210	78	200	76
Predorsal length	178	68	180	67	180	68
Preventral length	145	56	150	56	150	58
Head length	61	23	64	24	62	24
Snout length	13	5	15	5	15	6
Pectoral length	152	58	190	70	175	66
Ventral length	70	27	70	26	72	27
Dorsal height	26	10	21	8	21	8
Body height	50	19	50	18	50	19
Body breadth	39	15	35	13	35	13
Interorbital breadth	24	9	26	10	26	10
Eye diameter	20	8	21	8	23	9

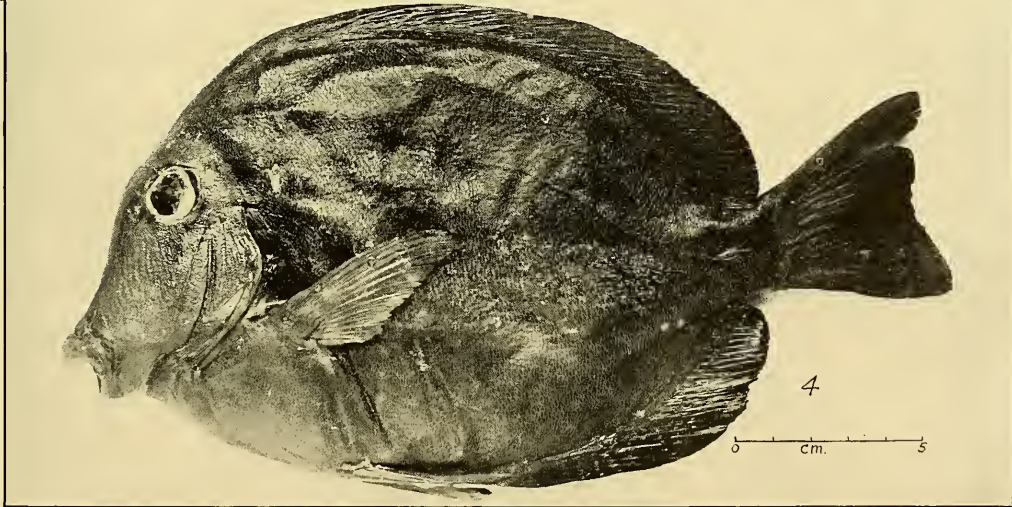


1.



2 0 cm. 5

3 0 1 cm. 3 4 5



4

0 cm. 5

1, *Maculocoetus suttoni*, n.g. et sp.—2, *Gymnothorax dakini*, n. sp.
3, *Gymnothorax garsiae*, n. sp.—4, *Teuthis fuliginosus*.

Colour in formalin dark blue-grey above, merging into white below. Dorsal fin with large black spot spread over about the fourth to the ninth rays. Caudal grey, ventrals white, not conspicuously marked. Upper pectoral rays greyish above, colourless below, lower pectoral rays colourless. Membrane of pectoral with large dark spots which are more numerous towards distal region of fin. These spots are very characteristic. Teeth on jaws very small. Palate toothless.

Description based on the holotype (Aust. Museum Reg. No. IA.6996), 260 mm. standard length. Named in honour of Professor Harvey Sutton, of the School of Tropical Medicine, Sydney University.

Ocean Id. (Waite); Nauru (Dakin). Three specimens, Nos. IA.6996 and IA.7142-3.

Family HOLOCENTRIDAE.

Genus HOLOCENTRUS Scopoli, 1777.

18. HOLOCENTRUS ERYTHRAEUS Günther. Iu n Anubwumin; Squirrel Fish.
Holocentrus erythroeus Waite.—*H. erythraeus* Fowler.
Ocean I. (Waite). Nauru (Dakin; IA.7127-9. Three specimens).

Genus MYRIPRISTIS Cuvier, 1827.

19. MYRIPRISTIS MURDJAN (Bonnaterre). Iu n Anubwumin; Squirrel Fish.
Nauru (Dakin). IA.7130-1. Two specimens.

Family MUGILIDAE.

Genus ELLOCHELON Whitley, 1930.

20. ELLOCHELON VAIGIENSIS (Quoy & Gaimard). Eaeor; Mullet.
Portion of a large specimen. Nauru (Sutton). IA.7145.

Family EPINEPHELIDAE.

Genus EPINEPHELUS Bloch, 1793.

21. EPINEPHELUS TAUVINA (Bonnaterre). Iwuro; Rock Cod.
One specimen with D.xi/14; A.iii/8. Interorbital less than eye-diameter. Preopercular serrae not enlarged. Mandibular teeth almost uniserial. Opercular spines equidistant. Caudal fin rounded. Colour very dark brown with spaced rusty-reddish spots. No saddle-shaped blotches. Standard length, 234 mm.
Nauru (Dakin). IA.7140.
22. EPINEPHELUS MERRA Bloch. Spotted Rock Cod.
Epinephelus merra Waite.—*Serranus merra* Fowler, 1928 and 1934.
Ocean I. (Waite).

Genus CEPHALOPHOLIS Bloch & Schneider, 1801.

23. CEPHALOPHOLIS SONNERATI (Cuvier & Valenciennes). Egabotsijij; Black Rock Cod.
Nauru (Dakin). IA.7002.
24. CEPHALOPHOLIS AURANTIUS (Cuvier & Valenciennes). Iu n Anepe; Golden Rock Cod.
Nauru (Dakin). IA.7144.
25. CEPHALOPHOLIS MINIATUS (Bonnaterre). Iwuro or Eanit; Spotted Rock Cod.
Nauru (Dakin). IA.7003-4; 2 specimens listed as Iwuro or Eanit. IA.7139; 1 specimen listed as Iwuro.

Genus POGONOPERCA Günther, 1859.

26. POGONOPERCA OCELLATA Günther. Ekobwo-Bwija; Spotted Rock Cod.
Nauru (Dakin). IA.7005.

Family ANTHIIDAE.

Genus CHROMANTHIAS Whitley, 1935.

27. CHROMANTHIAS EXILIS Whitley. Text-fig. 2.

Chromanthias exilis Whitley, *Rec. Austr. Mus.*, xix, 4, Sept. 19, 1935, p. 233. Nauru.

Br. 4.D.xii/14; A.ii/14; P.22; V.i/5; C.15. L. lat. 19 plus 8 or 9 pores on caudal peduncle. L. tr. $2\frac{1}{2}/1/8\frac{1}{2}$. Sc. 33.

Head (10.5 mm.) equal to depth of body (10.5) and length of caudal fin (10.5) and 3.6 in standard length (38). Eye (3.25) subequal to interorbital (3.5) and upper jaw (3.2) and about one-third of head.

Eye subequal to interorbital; posterior orbital margin denticulated. Maxillary short, naked, with supplemental bone. Fine teeth on jaws and palate, none on tongue. Preorbital with a row of mucous glands. Preoperculum finely denticulated posteriorly, without antrorse spines. Three to four rows of cheek-scales. Body covered with ciliated scales. Two to three scale-rows between lateral line and back. No squamulae. Dorsal fins united, without produced spines, rays long. Two anal spines. Pectoral rays divided, the upper ones longest. Ventrals behind level of pectoral base, their first rays long. Caudal forked. Colour, in alcohol, uniform reddish-brown above and silvery below. Eye dark bluish. Dorsal fins dark brown. Other fins yellowish, the anal and caudal rather infuscated. Length, 35 to 38 mm. in standard length.

Holotype and paratype in Austr. Mus. Regd. no. I.6681. The holotype is now figured for the first time.

Genus PSEUDANTHIAS Bleeker, 1873.

28. PSEUDANTHIAS PLEUROTAENIA (Bleeker).

Anthias pleurotaenia Waite; also Fowler, 1928 and 1934. Nauru (Waite).

NAURUA, n. gen.

Orthotype, *Naurua waitei*, n. sp.

A series of small Anthiid fishes from Pleasant Island was left unnamed by Waite, regarded with considerable doubt as *Anthias*? by McCulloch (in MS.), and briefly recorded as "a small percoid fish" by Whitley in 1935. Attacking them afresh, we are now convinced that these specimens represent a new genus and species of Anthiidae. They are easily distinguished from their congeners by their elongate form, large number of scales, and numerous dorsal rays, besides many other minor characters. In fact, they might well be separated as a new subfamily, the Nauruinae.

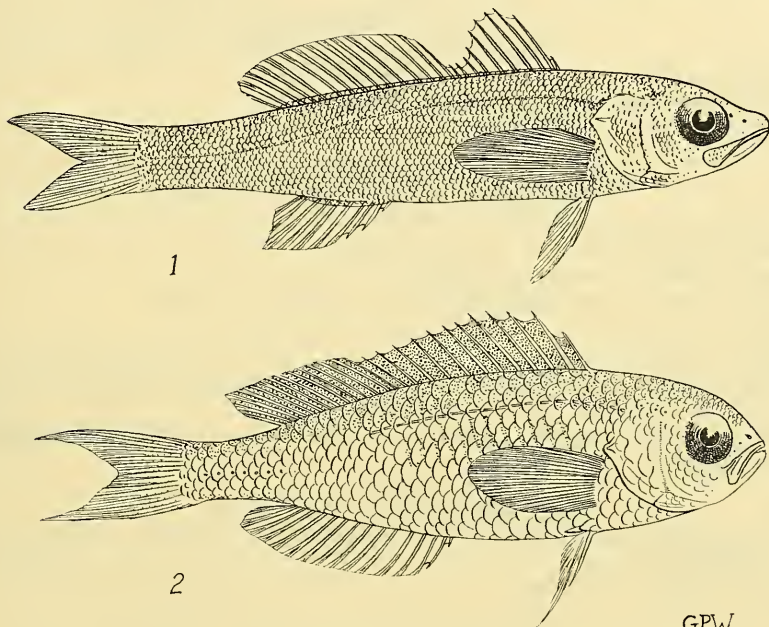
29. NAURUA WAITEI, n. sp. Text-fig. 1.

Br. 5. D.x/15; A.iii/7; P.22; V.i/5; C.13. L. lat. 72. L. tr. 4/1/19. Vertebrae 25.

Head (9.25) 3.5, depth (7) 4.6 in standard length (32.5). Eye (3) greater than interorbital (2.5). Snout (2) 4.6, length of pectoral (7) 1.3, depth of caudal peduncle (4) 2.3 in head.

Profile excavate before eyes. Snout naked, rest of head scaly. About six rows of cheek-scales. Eye large, posterior orbital margin crenulated. Interorbital convex, scaly. Preorbital very narrow. Snout overhanging mouth. Maxillary broad, scaly, just reaching to hinder half of eye; no supplemental bone. Dentition weak, on jaws and palate, consisting of a row of small hooked teeth. There is a small canine on each side of the excavated premaxillary symphysis, also a recurved canine on each side of the mandibular symphysis, and another some way back

on each side of mandible. Tongue long, acutely pointed, edentulous. Premaxillary processes short. One well developed opercular spine before the flap. Some sharp spines (probably becoming obsolete with age) on ascending limb of preoperculum; lower limb and all other opercles entire. Some mucus pores on snout and preopercular flange. Nostrils rounded, without flaps. Brain visible through roof of head. Pseudobranchiae well developed. Gill-membranes united in front of isthmus. Gill-rakers slender, denticulated, about 2 mm. long, and about twenty in number on the lower part of the first branchial arch. Gill-filaments thick.



GPW.

Text-fig. 1.—*Naurua waitei* Whitley & Colefax. Holotype from Nauru.
G. P. Whitley del.

Text-fig. 2.—*Chromanthias exilis* Whitley. Holotype from Nauru.
G. P. Whitley del.

Form elongate, tapering, compressed. Caudal peduncle long. Head and body covered with small strongly striated ctenoid scales, some of which form low sheaths to fins. No enlarged axillary scales. Lateral line complete, composed of single-tubed scales with their margins notched. The lateral line descends gently below the soft dorsal fin and does not form an angle on the sides. Four or five rows of scales between dorsal fin and lateral line.

Dorsal fin originating behind vertical of pectoral and ventral bases. Its first spine small, third and fourth longest, the remainder decreasing in size and united to soft dorsal. No produced spines or rays. Base of spinous dorsal fin rather less than distance from end of soft dorsal to root of tail, and considerably less than base of soft dorsal. Second anal spine thickest, third longest, yet notably shorter than anal interhaemals. Anal short, its termination in advance of that of dorsal. Pectorals on lower half of body, long, rounded, with the rays branched. Ventral fins originating behind level of pectoral base; first ventral ray long but not nearly reaching vent. Caudal forked.

General colour, after long preservation in alcohol, straw-yellowish, the fins lighter. Four patches of large dark chromatophores on vertex of head. A few speckles along back. Eye dark blue.

Described and figured from the holotype of the new species, the largest of eight specimens $1\frac{1}{4}$ to $1\frac{1}{2}$ inches long, or 32.5 mm. in standard length. Australian Museum regd. no. I.6680. Holotype and paratypes.

Named in honour of the late Edgar Ravenswood Waite, well known Australian ichthyologist, and the pioneer in the study of the fishes of Nauru.

Family DULEIDAE.

Genus MORONOPSIS Gill, 1862.

30. MORONOPSIS TAENIURUS (Cuvier & Valenciennes).
Kuhlia taeniura Waite; *K. taeniura* Fowler.
Ocean I. (Waite).

Family CARANGIDAE.

Genus CARANX Lacépède, 1802, *sensu lato*.

31. CARANX IGNOBILIS (Bonnaterre). Trevally.
Caranx hippos Waite.—*C. ignobilis* Fowler.
Nauru (Waite). Ocean I. (Waite).
32. CARANX SEXPASCIATUS Quoy & Gaimard. Eapwae; Trevally.
D.vii/i, 22; A.ii/i, 18. Scutes 30.
Nauru (Dakin). IA.6997.
33. CARANX MELAMPYGUS Cuvier & Valenciennes. Iquidada or Emwena; Trevally.
D.vii/i, 23; A.ii/i, 20 (21). Scutes 33.
Nauru (Dakin). IA.6998 (1 specimen labelled Emwena); IA.7141 (1 specimen labelled Iquidada).

Genus CHORINEMUS Cuv. & Val., 1832.

34. CHORINEMUS SANCTIPETRI Cuvier & Valenciennes. Eredeij; Leatherskin or Queenfish.
Nauru (Dakin). IA.6999.

Genus ELAGATIS Bennett, 1840.

35. ELAGATIS BIPINNULATUS (Quoy & Gaimard). Eoquo; Runner.
Nauru (Dakin). One (IA.7132) labelled "Yellow Tail".

Family LUTJANIDAE.

Genus LUTJANUS Bloch, 1790.

36. LUTJANUS FULVIFLAMMA (Bonnaterre). Ituwabu; Moses Perch.
Nauru (Sutton). Three small specimens. IA.7146 and IA.7175—juvenile.
37. LUTJANUS MARGINATUS (Cuvier & Valenciennes). Iname; Hussar.
Two specimens agree well with the plate of this species in Günther's "Fische der Südsee".

There are also three very small examples, with dusky margins to dorsal fins, which are tentatively regarded as the young of this species. They were listed as Iname or Small White Fish.

Nauru (Sutton). IA.7137-8 (2 specimens); IA.7165 and 7176 (3 very small examples).

Family MALACANTHIDAE.

Genus MALACANTHUS Cuvier, 1829.

38. MALACANTHUS HOEDTI Bleeker. Dobobu; Ocean Eye.
Nauru (Dakin). IA.7011.

Family MULLIDAE.

Genus MULLOIDICHTHYS Whitley, 1929.

39. MULLOIDICHTHYS SAMOENSIS Günther. Dauronoron; Goatfish.
Mulloides samoensis Waite.—*Mulloides samoensis* Fowler.
 Nauru (Waite; Dakin, IA.7010).

Family PEMPHERIDAE.

Genus PEMPHERIS Cuvier, 1829.

40. PEMPHERIS OTAITENSIS Lesson. Idibidib; Bullseye.
 One specimen speared on the reef.
 Nauru (Dakin). IA.7000.

Family KYPHOSIDAE.

Genus OPISTHISTIUS Gill, 1862.

41. OPISTHISTIUS SQUAMOSUS (Alleyne & Macleay). Ijibawo; Drummer.
Pachymetopon squamosum Alleyne & Macleay, Proc. Linn. Soc. N. S. WALES,
 Feb. 1877, p. 275, Pl. ix, fig. 1. Hall Sound, New Guinea.
 Nauru (Dakin). IA.7001.

Family CHAETODONTIDAE.

Genus CHAETODON Linné, 1758.

42. CHAETODON LUNULA (Lacépède). Butterfly Fish.
 Two interesting larvae, in the *Tholichthys* stage, measure about 17 mm. in
 standard length, and correspond to the phase figured in Günther's "Fische der
 Südsee", Pl. 33, fig. D.
 Nauru (Sutton). IA.7173.

Family HOLACANTHIDAE.

Genus POMACANTHODES Gill, 1862.

43. POMACANTHODES IMPERATOR (Bloch). Ikurubwurub; Imperial Angel Fish.
Pomacanthus imperator Fraser-Brunner, Proc. Zool. Soc. London, 1933, p. 556,
 Pl. i (refs. & synonymy).
 Nauru. IA.7157.

Family CIRRHITIDAE.

Genus CIRRHITUS Lacépède, 1803.

44. CIRRHITUS PINNULATUS (Bloch & Schneider). Iudud; Finger-fins.
Cirrhites maculatus Waite.—*Cirrhites pinnulatus* Fowler, 1928 and 1934.
 Nauru (Waite). Nauru (IA.7149).

Family GEMPYLIDAE.

Genus PROMETHICHTHYS Gill, 1893.

45. PROMETHICHTHYS PROMETHEUS (Cuvier & Valenciennes). Barracouta.
Promethichthys prometheus Waite; also Fowler, 1928 and 1934.
 Ocean I. (Waite).

[A section of the posterior end of an unidentifiable Scombroid is also included
 in the Nauru collection (No. IA.7158): native name, Egow. Also Hambruch
 mentions a Nauruan 'bonito'.]

Family RUVETTIDAE.

Genus RUVETTUS Cocco, 1833.

46. RUVETTUS TYDEMANI Weber. Eaeoquor or Te-kanebek; Palu or Oil Fish.
Ruvettus pretiosus Waite; also Fowler.

Ocean I. (Waite); Nauru (Sutton). A piece of integument, no. IA.7133, labelled *Eaquoqor*. Waite gave the native name as *Te-kanebek*. This species is known as *Palu* or *Paru* in other parts of Polynesia.

Family ISTIOPHORIDAE.

Genus ISTIOMPAX Whitley, 1931.

47. ISTIOMPAX AUSTRALIS (Wall). Marlin Swordfish.

Tetrapturus australis Wall, *Illustr. Sydney News*, March 11, 1854, fig. Broken Bay, N. S. Wales.—*Istiompax australis* Whitley, *Austr. Zool.*, vi, 1931, p. 321, and *Rec. Austr. Mus.*, xviii, 1931, p. 148.—*Makaira australis* Fowler, *Mem. Bish. Mus.*, xi, 1934, p. 400, fig. 2 (Tahiti, etc.).—"Marlin swordfish", A. E. Ellis, *Adv. Coral Seas*, 1936, pl. opp. p. 177 (Nauru).

The Marlin Swordfish, figured from Nauru by Ellis, is tentatively identified as this species.

Family TEUTHIDAE.

Genus CTENOCHAETUS Gill, 1884.

48. CTENOCHAETUS CTENODON (Cuvier & Valenciennes). Deiboe; Comb-toothed Surgeon Fish.

Nauru (Dakin). IA.7135-7136 (2 specimens).

Genus TEUTHIS Linné, 1766, *sensu lato*.

49. TEUTHIS FULIGINOSUS (Lesson). Eaborobor or Deriba; Surgeon Fish. Pl. xiv, fig. 4.

One small specimen (IA.7009) is typical and is labelled *Deriba* but a larger one (IA.7134) called *Eaborobor* represents an interesting colour variant which is here described and figured. It was speared through the body.

D.vii/27; A.ii/26; P.i/15; V.i/5, C.14.

Upper profile of head weakly concave anteriorly, swollen before eyes, and thence rising evenly to over dorsal spines. Dorsal profile more arched than ventral. Head, 58 mm.; depth of body, 118; depth of caudal peduncle, 24. Eye 13 mm.; interorbital, 21; preorbital, 36. Pectoral fin, 55; ventral, 46. Eye small. Interorbital convex. Cheeks very deep, scaly. Some striae on opercles and scapulars. Five or six incisor teeth (each with four or five blunt cusps) on either side of each jaw. Body deep, compressed, covered by small imbricate ctenoid scales. Caudal peduncle with one erectile antrorse spine on each side. Dorsal and anal spines largely covered by integument. Soft portions of fins evenly rounded, not greatly elevated. Pectorals almost as long as head.

Colour, in formalin, dark chocolate-brown with milky spots on middle of sides of body posteriorly; similar small milky spots on dorsal and anal fins. Chin whitish (? blue in life). Caudal dusky. Some yellow in pectoral axil. Inner parts of ventrals yellow, otherwise smoky to dusky. No conspicuous bands or patterns. In Lesson's figure of the type (*Voy. Coquille*, Pl. xxvii, fig. 2) the colour is uniform brown with some blue on the chin.

50. TEUTHIS LINEATUS (Linné). Iwiji; Striped Surgeon Fish.

Teuthis lineatus Waite.—*Hepatus lineatus* Fowler.

Nauru—Waite; Dakin (IA.7006).

51. TEUTHIS TROUGHTONI Whitley. Eweo; Banded Surgeon Fish. Fig. 3.

Teuthis trougtoni Whitley, *Rec. Austr. Mus.*, xvi, 1928, p. 233, Pl. xvi, fig. 1. Vanikoro, Santa Cruz Iss.—*Teuthis triostegus* Waite.—*Hepatus triostegus* Fowler.

This species is called *Manini* in nearly all Polynesian dialects. Our Nauruan ones are labelled Zebra fish, Eweo.

Nauru—Waite; Dakin (IA.7008, 7159, 7172) several, including juvenile stage. Ocean I. (Waite).

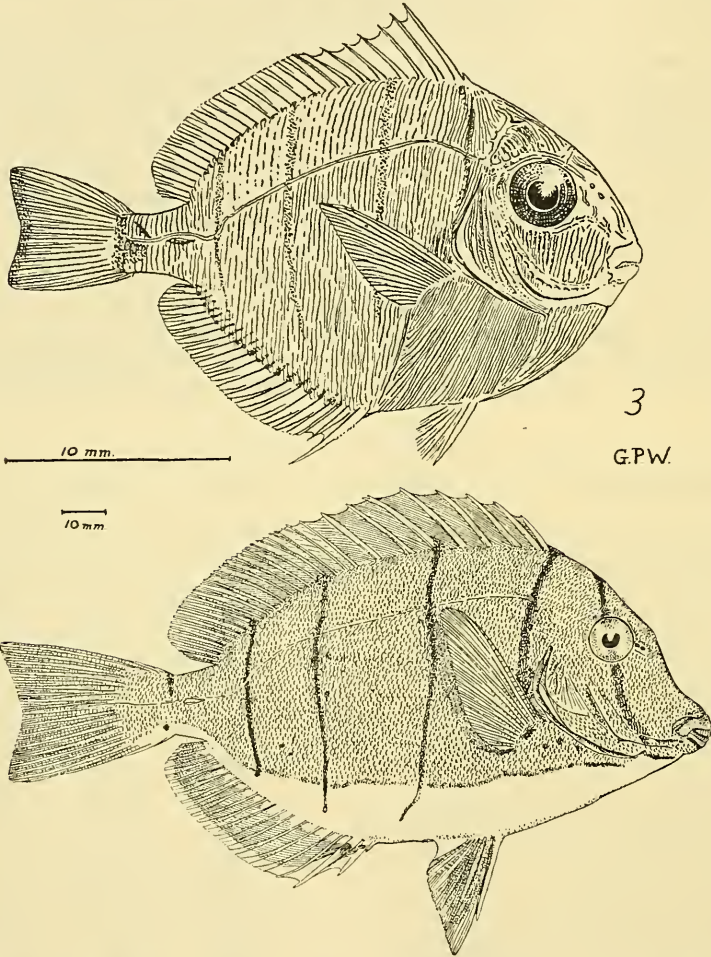
The larval and post-larval stages of the Surgeon and Unicorn fishes (Family Teuthidae) are not uncommon in warm seas. The Australian Museum has specimens from New South Wales, Queensland, the Solomon Islands, and New Hebrides. They are deep-bodied compressed little fishes an inch or so long; the sides are not scaly as in the adult but are crossed by subvertical ridges or bony striae, and there is usually a large silver area on the thorax. Except in a few cases it is impossible to identify these larval fishes with any certainty. In the past some authors have regarded them as distinct genera to which the names *Keris* (or *Ceris*), *Priodon*, *Acronurus*, and *Prionolepis* have been applied, but all these names (some of which are preoccupied) may be regarded as synonyms of *Naso*, the Unicorn fish. Jordan and Seale regarded fin-formulae as the best characters for identifying the larval Teuthidae, and, using this criterion, we can separate the larval forms which have been described into tentative subdivisions as follows. Those with five or six dorsal spines and three ventral rays are evidently young *Naso*. Those with nine dorsal spines and five ventral rays are probably *Teuthis* juveniles, but there are others which do not fall easily into either group, whilst very small larvae have not developed ventral rays at all, only a ventral spine.

Nominal Identification.	Locality.	Dorsal.	Anal.	Ventral.
<i>Priodon annulatus</i> Q. and G. ..	Timor.	v/29	ii/29	i/3
<i>Priodon annularis</i> C. and V. ..	Timor.	v/28	ii/27	i/3
<i>Prionolepis hewittii</i> Smith ..	South Africa.	v/29	ii/28	i/2 or 3
<i>Naseus</i> sp. Weber	East Indies.	v/28	ii/28	i/-
<i>Naseus</i> sp. Weber	East Indies.	vi/23	ii/27	—
<i>Naseus</i> sp. Weber	East Indies.	vi/30	ii/30	—
<i>Keris anginosus</i> C. and V. ..	No locality.	vii/26	iii/28	i/5
<i>Keris anginosus</i> Bleeker, Günth.	East Indies.	vi/26	ii/28-29	i/3
<i>Keris amboinensis</i> Bleeker ..	East Indies.	vi/29	ii/30	i/3
<i>Acanthurus</i> sp. Weber	East Indies.	viii/23	iii/22	i/-
<i>Teuthis troughtoni</i> Whitley ..	Nauru.	viii/22	iii/21	i/5
<i>Acanthurus orbicularis</i> C. and V.	No locality.	ix/28	iii/27	i/6?
<i>Acanthurus argenteus</i> Q. and G.	Sandwich Islands.	ix/27	iii/26	i/5
<i>Acanthurus melanurus</i> C. and V.	Pondicherry.	ix/26	—	—
<i>Acanthurus melanurus</i> Günther	Borneo.	viii/25	iii/25	—
<i>Acanthurus coeruleus</i> Lütken ..	Atlantic Ocean.	ix/24-28	iii/23-26	i/5
<i>Acanthurus striatus</i> Q. and G.*	Guam?	ix or x/33	iii/25	i/5
<i>Acronurus brevispinis</i> Günther	No locality.	ix/?	iii/?	i/2
<i>Acronurus formosus</i> Castelnan..	Queensland.	viii/31	iii/32	i/5
<i>Teuthis elegans</i> Garman ..	Cocos Islands.	ix/22	iii/21	i/5
<i>Hepatus elegans</i> Kamohara ..	Japan.	ix/26	iii/23	i/4

* Probably young *Ctenochaetus*.

The Australian Museum specimens are withheld for future study, but in the Nauruan collections we find an interesting banded post-larva (quite different from any in the Museum) together with very slightly larger specimens which conclusively link the juvenile with the species *Teuthis troughtoni*. This Nauruan specimen is 27.5 mm. in length from snout to end of middle caudal rays, and is thus slightly less than one-fifth the length of the Vanikoro holotype, so both specimens are illustrated here (Fig. 3) to show the changes which take place

with growth. The juvenile is at the end of the larval phase because a very slightly larger specimen has metamorphosed and developed scales in place of the granular body-ridges of the larva. As tabulated above, the Nauruan larva has



Text-fig. 3.—*Teuthis troughtoni* Whitley. Juvenile specimen from Nauru and adult holotype from Vanikoro. G. P. Whitley del.

D.viii/22, A.iii/21, P.15, and V.i/5. The lateral line and mucus system are prominent and the caudal spine is developed. The main anal spine still retains the serrations and a fair degree of elongation as relics of the early larval stage, but there are no serrations on the profile of the head.

The colour is pale yellowish with dark markings (as shown in the figure) formed by brown chromatophores in the skin below the very numerous sub-vertical body-ridges. The posterior part of the head and visceral part of the thorax are dusky rather than silvery.

The following is a list of papers which we have consulted concerning larval Teuthidae:

1824. Quoy and Gaimard, Voy. "Uranie" et "Physicienne", Zoologie, i, 1824, p. 377, Pl. lxiii.
 1835. Cuvier and Valenciennes, *Hist. Nat. Poiss.*, x, 1835, pp. 166-308, Pl. ccxv.
 1852 to 1878. Bleeker, various papers as listed by Weber and de Beaufort, Fish Indo-Aust. Archipel., i, 1911.
 1854. Gray, Cat. Fish coll. Gronow Brit. Museum, 1854, p. 190.
 1861. Günther, Cat. Fish. Brit. Mus., iii, 1861, pp. 345 and 355.
 1865. Kner, Reise der "Novara", Fische, i, 1865, p. 212.
 1871. Klunzinger, *Verh. Zool.-Bot. Ges. Wien*, xxi, 1871, p. 510.
 1873. Castelnau, *Proc. Zool. Soc. Vict.*, ii, 1873, p. 104.
 1875. Günther, *Journ. Mus. Godeffroy*, ii, 9 (Fische der Südsee, iv), Feb., 1875, pp. 108-124, and figs.
 1880. Lütken, *Spolia Atlantica, Vid. Selsk. Skr.*, 5R, xii, 6, 1880, pp. 579 and 609, Pl. v.
 1899. Garman, *Mem. Mus. Comp. Zool. Harvard*, xxiv, 1899, p. 70, Pl. I, fig. 2.
 1906. Jordan & Seale, *Bull. U.S. Bur. Fisheries*, xxv, 1905 (1906), p. 354.
 1913. Weber, Siboga Expeditie, Fische, May, 1913, p. 319, figs. 70-71.
 1913. Beaufort, *Bijdragen tot de Dierkunde, Nat. Art. Mag. Amsterdam*, 1913, pp. 125-126.
 1928. Fowler, *Mem. Bern. P. Bishop Mus.*, x, 1928, p. 264.
 1931. Smith, *Rec. Albany Mus.*, iv, 1931, p. 145 (*Prionolepis*, a preoccupied name, given to a supposed new genus of Grammicolepidae, but actually a young *Naso*.)
 1934. Delsman and Hardenberg, *De Indische Zeevischen*, 1934, p. 274, fig. 197.
 1936. Herre, *Field Mus. Nat. Hist., Zool. Series*, xxi, 1936, p. 240.
 1937. Kamohara, *Zool. Mag. (Japan)*, xlix, 7, 1937, p. 256, fig. 1.

52. TEUTHIS GLAUCOPAREIUS (Cuvier). Deriba or Deiboë; Surgeon Fish.
Acanthurus glaucopareius Cuvier, Règne Animal, ed. 2, ii, April, 1829, p. 224, footnote. Based on "Seb., iii, xxv, 3". East Indies. *Id. Kittlitz, Mus. Senckenb. Abhand.*, i, 1834, p. 193, Pl. xiii, fig. 3 (Ulea, Carolines).

Fowler (*Mem. Bish. Mus.*, x, 1928, p. 272) gives the original reference to this species as "*Harpurus glaucopareius* (Forster) Schneider, Systema ichth., Bloch, p. 212, 1801". But Bloch and Schneider do not quote that name and there is no reference earlier than Cuvier's in Sherborn's *Index Animalium*.

Nauru (Dakin). IA.7007, 7160 (several specimens). IA.7007 is labelled *Deiboë*; 7160 is labelled *Deriba*.

Genus ZEBRASOMA Swainson, 1839.

53. ZEBRASOMA FLAVESCENS (Bennett). Ekamwigogo; Deep-bodied Surgeon Fish.
 One specimen of the dusky colour-form of this species.
 Nauru. IA. 7155.

Genus NASO Lacépède, 1801.

54. NASO UNICORNIS (Bonnaterre). Unicorn Fish.
Naseus unicornis Waite.—*Naso unicornis* Fowler.
 Nauru (Waite).

Family ZANCLIDAE.

Genus ZANCLUS Cuv. & Val., 1831.

55. ZANCLUS CANESCENS (Linné). Moorish Idol.
 Nauru. IA.7156 (three specimens).

Family BOTHIDAE.

Genus BOTHUS Rafinesque, 1810.

56. BOTHUS PANTHERINUS (Rüppell). Flounder.
Rhomboidichthys pantherinus Waite.—*Platophrys pantherinus* Fowler, 1928 and 1934.
 Nauru (Waite).

Family POMACENTRIDAE.

Genus EUOMACENTRUS Bleeker, 1877.

57. EUOMACENTRUS LIVIDUS (Bloch & Schneider). Eadere; Demoiselle.
Nauru (Sutton), as Small Black Fish, *Eadere*. IA.7164 and 7178 (10 small specimens). IA.7177 is one young specimen only 13 mm. in standard length.

Genus GLYPHISODON Lacépède, 1803.

58. GLYPHISODON BIOCELLATUS (Quoy & Gaimard). Demoiselle.
Glyphidodon brownriggii Waite.—*Abudefduf biocellatus* Fowler.
Nauru (Waite).

Family LABRIDAE.

Genus THALASSOMA Swainson, 1839.

59. THALASSOMA QUADRICOLOR (Lesson). Earamae and Eareij; Parrot Fish.
Julis quadricolor Lesson, *Dict. Class. Hist. Nat.*, xiii, January, 1828, p. 27, and *Mem. Soc. Hist. Nat. Paris*, iv, Sept., 1828, p. 400, and *Voy. Coquille*, ii, 1831, p. 139, pl. xxxv, fig. 1. Tahiti and Bora Bora.—*Thalassoma purpurea* Waite.—*Thalassoma purpureum* Fowler, 1928.—*Thalassoma quinquevittatus* Fowler, 1934.—*Thalassoma quadricolor* Whitley, *Austr. Zool.*, viii, 4, March 12, 1937, p. 225, Pl. xiv, fig. 1 (refs. & synonymy).

Nauru (Waite).

Professor Dakin obtained two specimens of this species, of which one (no. IA.7012) was called *Earamae* by the natives, and the other (IA.7013) *Eareij*.

60. THALASSOMA MELANOCHIR (Bleeker). Parrot Fish.
Thalassoma melanochir Waite; also Fowler, 1928 and 1934.
Nauru (Waite).

Family BLENNIIDAE.

Genus NIXIBLENNIUS Whitley, 1930.

Nixiblennius Whitley, *Mem. Qld. Mus.*, x, 1930, p. 20. Orthotype, *Blennius snowi* Fowler.

61. NIXIBLENNIUS SNOWI (Fowler). Snow's Blenny.
Blennius snowi Fowler, *Mem. Bern. P. Bishop Museum*, x, 1928, p. 431, fig. 71. Strong Island, Carolines.

From an ichthyological viewpoint, one specimen of this species from Nauru is of great interest, since it is the third known specimen, only the holotype and paratype in the Museum of Comparative Zoology, Harvard, having been recorded hitherto.

The very long ocular tentacles and high spinous dorsal fin are characteristic features. Our specimen agrees well with Fowler's account, differing only in having a small, simple tentacle over each nostril, the body-markings a trifle darker, and in lacking white spots on head and pectoral base. It is 47 mm. long and thus the largest known.

Nauru, on reef flat (Sutton). IA.7170.

Subfamily SALARIINAE.

Genus SALARIAS Cuvier, 1816.

62. SALARIAS CAUDOLINEATUS Günther. Striped Blenny.
Nauru (Sutton). IA.7168 (1 specimen); IA.7169 (1 specimen).
63. SALARIAS EDENTULUS (Bloch and Schneider). Demadara; Jumping Joey.
Nauru (Sutton), listed as Grey Fish, with native name Demadara (IA.7166-

7167); 2 specimens agreeing with Günther's figure of "*S. quadricornis*" in "Fische der Südsee", Pl. 117, fig. B, rather than with the form he figured as *S. edentulus* (fig. A).

64. *SALARIAS PERIOPHTHALMUS* Cuvier & Valenciennes. Blenny.

Salarias periophthalmus Waite.—*S. periophthalmus* Fowler, 1928 and 1934. Nauru (Waite).

Genus *CRENALTICUS* Whitley, 1930.

65. *CRENALTICUS MELEAGRIS* (Cuv. & Val.). Blenny.

Salarias meleagris Waite; also Fowler. Ocean I. (Waite).

Family Gobiidae.

Genus *BATHYGOBIUS* Bleeker, 1878.

66. *BATHYGOBIUS FUSCUS* (Rüppell). Ekageg; Goby.

Gobius albopunctatus Waite.—*Bathygobius fuscus* Fowler, 1928 and 1934. Ocean I. (Waite). Nauru (Sutton). IA.7161, 7174 (several specimens).

Family ECHENEIDAE.

Genus *LEPTECHENEIS* Gill, 1864.

67. *LEPTECHENEIS NAUCRATES* (Linné). Ananit-iu; Sucking Fish.

Nauru (Dakin). IA.7015.

Family SCORPAENIDAE.

Subfamily PTEROINAE.

Genus *PTEROIS* Schinz, 1822.

68. *PTEROIS VOLITANS* (Linné). Eono; Butterfly Cod.

Nauru (Dakin). IA.7014.

Family BALISTIDAE.

Genus *SUFFLAMEN* Jordan, 1916.

69. *SUFFLAMEN FRAENATUS* (Latreille). Ebwado and Ewbabwa; Trigger Fish or File Fish.

Balistes fraenatus Latreille, *Nouv. Dict. Hist. Nat.*, xxiv, March 7, 1804, p. 74. *Ex* Lacépède, vernac. No locality.—*Sufflamen fraenatus* Whitley, *Mem. Qld. Mus.*, xi, 1937, p. 146.

Nauru (Dakin). Two specimens, of which one (IA.7016) was listed as *Ebwado*, and the other (IA.7017) *Ewbabwa*.

Genus *MELICHTHYS* Swainson, 1839.

70. *MELICHTHYS VIDUA* Richardson. Ipo; Black File Fish.

Balistes vidua Richardson, *Zool. Sulphur*, 1845, p. 128, Pl. lix, figs. 9–10. *Ex* Solander MS. Tahiti.

Nauru. IA.7151–2 (2 specimens).

Genus *XANTHICHTHYS* Kaup, 1858.

71. *XANTHICHTHYS RINGENS* (Linné). Ipo; File Fish.

Nauru. IA.7153.

Family ALEUTERIDAE.

Genus *CANTHERHINES* Swainson, 1839.

72. *CANTHERHINES PARDALIS* (Rüppell). Ekamwigogo or Ipo; Leatherjacket.

Our specimens agree best with the figure in Günther's "Fische der Südsee".

As regards the native names, one specimen was attached to *Xanthichthys* and *Melichthys* with the label *Ipo*, and another was united with *Zebrasoma* under the name *Ekamwigogo*.

Nauru. IA.7150 and 7154 (2 specimens).

Genus OSBECKIA Jordan & Evermann, 1896.

73. OSBECKIA SCRIPTA (Forster). Eroreto and Erorato; Scribbled Leatherjacket. Nauru (Dakin). Two specimens, of which one (IA.7018) was called *Eroreto* and one (IA.7019) *Erorato*, the natives apparently making some subtle distinction between phases of this variable species.

Family TETRAODONTIDAE.

Genus OVOIDES Anon., 1798.

74. OVOIDES MELEAGRIS (Bloch & Schneider). Toado. Nauru (Dakin). IA.7020-1 (2 specimens).

NATIVE FISHING METHODS.

We are indebted to Professor W. J. Dakin for the following interesting account of native fishing methods, and related topics.

Supply of Fish.—Whatever the actual quantity of fish—the productivity of the Nauruan waters—there is no doubt that by the modest apparatus in use excellent catches can be easily obtained. As contrasted with the colder waters of the world, one finds that instead of large quantities of a few sorts of fish, there is a considerable diversity of species. Hambruch ('Nauru', 2 vols. Hamburg, 1914, 1915) states that the natives recognize 300 different species. Since, however, the fish often receive different names at different ages and sizes, it is likely that the number of fish species of any significance is far less than this.

There is undoubtedly a seasonal occurrence of certain fishes, and this is particularly interesting because marine conditions should be much more uniform at Nauru than in colder seas.

At the present time the supply of fish is evidently not equal to the demand in the island. This is largely due to the keenness of the Chinese workmen for fish and their ability to pay for them, coupled with what is now the lack of any necessity on the part of the Nauruans for fishing as an industry. They can obtain bully beef and other commodities with less trouble.

I did not meet any native who could have been described as an active fisherman in the sense of, say, the fisherman of Ceylon or the European fisherman.

Methods of Fishing.

Lines with temporary hooks (see Hambruch).—Two illustrations are given by this author, in which a fine line is suspended by a float. To the lower end of the line a fishbone hook or a pandanus leaf thorn is attached and baited. The fish caught by this means are, however, small, and the lines are really used more for fun (probably by the young) than for anything else. The line with float is left by itself until the float disappears.

Lines with proper fish-hooks.—There are several types of lines used by the Nauruans, and line fishing is actually the most important method of fishing employed at present. The length of line, its strength, the type of hook and bait, vary according to the fish which are to be caught and the site of the fishing. Formerly, of course, the lines were of coconut fibre, Hibiscus bast, or sea grass, but now European cords are most frequently used. The hooks, too, are of metal rather than of mother-of-pearl, coconut shell or hardwood. The Nauruans do not

prefer the metal European baited hooks for all purposes. They seem to find steel non-barbed hooks quite effective for much of their fishing and prefer these on certain occasions. The mother-of-pearl hooks figured by Hambruch (figs. 211 to 215) are no longer used and this also seems to apply to the *spinners* figured on p. 128 (figs. 216-218) which carried artificial flies of human hair, or the bristles of pigs, or dog's hair. Surface trolling, however, is employed for *bonito*. A line of 90-foot length is used for the purpose and the spinner is made of sea-bird feathers.

With line, hook, and bait, various kinds of fish can be caught according to the length of line used, and the nature of the bait employed. Hambruch states that with flying fish as bait one catches *eaer*, *erae*, *eonubue*, *ijibauuo*, *eapai*, *emuen*, *ebo*; with long line, *irep* and *irum* (*uenion*); with a long and strong line and with two flying fish as bait, sharks (smaller species).

There are evidently many variations of the methods used, and other types of bait include the lagoon fish *Ibija*, molluscs from the reef, small reef-fish, hermit crabs and cuttle-fish. In some cases no permanent sinker is wanted and a very interesting method is then utilized for sinking the hook. The line at the hook end is wrapped several times around one or two flat stones and secured there with a temporary hitch so that a sudden jerk on the line, after the hook has been let down the required depth, releases the stones. Pieces of fish, etc., may be placed between the stones so that as they fall apart when released, a little cloud of food fragments is also released as fish 'burley'. With a line of 25 fathoms or so this method is used for 'yellow tail' (? *eaquoi*).

With a 600-ft. line the method is employed for bonito (*itsibap* or *itibap*). A much shorter line, 30 ft., also with releasing sinkers, is used for catching '*iquori*'. For certain of the large fish which Nauruans catch at depths of 100 fathoms and over, heavy sinkers of stone or metal are used and a large hook is hidden completely by slitting a fish, and lashing it securely around the hook. The method of attaching the bait appears to be different, however, according to the species of fish to be caught.

A Nauruan trick which does not seem to be much used now was the attracting of fish—particularly sharks—by 'rattles'. One of the most common types consisted of a series of large cowrie shells on the end of a long line. By lowering these to the bottom and pulling the line up and down (a foot or so of movement), a noise was produced which was said to have attracted the sharks.

Capturing fish by lasso.—The Anabar people are reported to be expert at catching 'barracouta' with lasso. There are two methods of using lassos. One consists of line alone and is used for capture of larger sea creatures such as narwhal and the large sharks which are attracted by the scattering bait—'burley'—or by bait attached to the sling itself. The other method employs a lasso line attached to a rod about two feet in length and is used for eel capture. I was told, however, that the stick sling for eels has been practically given up.

Spearing Fish.—The capture of fish by spearing whilst the fisherman is swimming in the sea seems to be a new method which the Nauruans have learned in recent times. The fisherman wears special spectacles (imported from China) and swims slowly in the water just along the margin of the reef. He searches deliberately for his fish under water and wields the spear at what he sees under water. The method is, therefore, not the same as the more common native method practised by the Australian aborigine, who throws the spear from above the water. On the occasion of the fishing competition at Nauru, many of the competitors used

the spear in this way for the purpose of capturing fish for bait before setting out in their canoes.

The 'Eanape Fishing Apparatus'.—One of the most favoured methods of Nauruan fishing is the use of a long line attached to a small iron frame which bears several hooks. It is an attempt, therefore, towards the increase in the number of baited hooks, but there is nothing like the huge numbers on modern long lines in North Atlantic waters. The common apparatus consists of iron rods bearing wire offshoots, each of which terminates in a baited hook. There may be twenty such hooks. A variation of the method is the 'Eiror' apparatus for big fish. In this case there is no semi-rigid frame supporting the 'snoods', or hooks. At the end of the line, however, there is a series of stout wire rods each of which is linked by a comparatively loose joint with the one in front and the one behind. From each joint another rod (about one foot long) projects out at right angles and to the end of this the snood with baited hook is fastened. The scheme is essentially the same as the Eanape, except that the terminal section of the line which bears the hooks is more extended and less rigid.

Fishing Nets.—I have seen only two types of net in use and both are employed on the reef flat at high tide. One of these is to all intents and purposes a seine net, except that it is much smaller and, instead of being paid out in a semicircle from a boat, it is carried by two men who walk together, each bearing half of it upon a pole over the shoulder. Several other helpers may join them. On the appearance of a shoal of fish, the two carriers separate, letting the net fall gradually off the poles until it forms a semicircle. The fish are then surrounded, the other assistants splashing and frightening the fish to keep them within the enveloping net. The upper margin of the net is supported by floats, the bottom weighted with lead.

The other net is a conical hand-net without any rigid supports. It is held at the apex—the closed end—and the lower edge, which is about twenty feet round, is weighted at regular intervals by lead sinkers. The net has to be thrown upon a shoal of fish, leaving the hand altogether, and the movement requires skill. The whole action is really very beautiful. Both nets are very efficient in their small way, and it is doubtful whether a really large seine net could be used on the uneven coral reef flat where the water is never really deep enough for it.

The Iquan Net (Ikuan) and its larger type the *Egogo*.—The Ikuan net is a small bag-net supported by a metal or wooden ring (hoop) about two feet in diameter. It bears a sinker below and is sunk down at the end of a long line. A piece of bait is fastened in the net. The whole success of this rather primitive method depends upon the fisherman who is holding the line feeling the bite of the fish at the bait. He must then haul up rapidly. I was not surprised to find that this method was little used now. I have not seen a net which could be used for Egogo fishing. It was apparently large enough to require two canoes and was manipulated in the same way.

Fish Traps.—It is surprising, considering the use by natives at other islands, that fish traps are rarely employed nowadays at Nauru. Two sizes were formerly used and Hambruch states that the use of the larger one was accompanied with much ritual. The trap is illustrated by him, but I never even saw one on the island. This is strange, for he states that anything up to one thousand fish might be caught in it. The principle is just the same as that of fish traps all over the world. It was apparently lowered two hundred fathoms and left for three days. The small trap is for the capture of eels, although infrequently.